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## CLAIMS

**We claim:**

- 5           1. A method of detecting the presence of *Treponema pallidum* or anti-treponemal antibodies in a biological sample, comprising:
- contacting an acidic repeat protein or one or more isolated, immunogenic *Treponema pallidum* peptide of the acidic repeat protein with an antibody-containing biological sample; and
- 10                 detecting formation of a complex between the immunogenic protein or peptide and the antibody, wherein the presence of the complex indicates the presence of *Treponema pallidum*.
2. The method of claim 1, wherein the isolated immunogenic
- 15 *Treponema pallidum* peptide is a peptide within a repeat region of the acid repeat protein.
3. The method of claim 1, wherein the immunogenic peptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 2, 4, 6,
- 20 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26, and conservative variations thereof.
4. The method of claim 1, wherein the immunogenic peptide is encoded by a nucleotide sequence as shown in SEQ ID NOs: 1, 3, 5, 19, 21, 23, and 25.
- 25           5. The method of claim 1, wherein the immunogenic peptide comprises an amino acid sequence having the sequence shown in SEQ ID NO: 15.
6. The method of claim 1, wherein the *Treponema pallidum* is *T. pallidum* subspecies *pallidum*, *T. pallidum* subspecies *pertenue* (CDC-2 strain), *T. pallidum* subspecies *pertenue* (CDC-1 strain), or *T. pallidum* subspecies *endemicum*.
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23. An immunogenic composition comprising a pharmaceutically acceptable carrier and an isolated, immunogenic *T. pallidum* peptide in an amount sufficient to induce a protective immune response to *T. pallidum* in a mammal, the immunogenic peptide comprising an amino acid sequence as shown in SEQ ID  
5 NOs: 2, 4, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 20, 22, 24, 26 or conservative variations thereof.

24. The composition of claim 23, wherein the *Treponema pallidum* is *T. pallidum* subspecies *pallidum*, *T. pallidum* subspecies *pertenue* (CDC-1 strain), *T.*  
10 *pallidum* subspecies *pertenue* (CDC-2 strain), or *T. pallidum* subspecies *endemicum*.

25. The composition of claim 23, wherein the composition is administered to a subject having syphilis, yaws, or bejel.

15 26. The composition of claim 23, wherein the immunogenic peptide is conjugated to a carrier protein.

27. The method of claim 1, wherein the immunogenic peptide comprises an amino acid sequence having the sequence shown in SEQ ID NO: 20.  
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28. A kit for detecting *T. pallidum* in a biological sample using the method of claim 1, comprising an acidic repeat protein or one or more isolated, immunogenic *Treponema pallidum* peptide of the acidic repeat protein, and instructions for carrying out the method of claim 1.  
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29. A kit for detecting *T. pallidum* in a biological sample using the method of claim 16, comprising an antibody to an immunogenic *T. pallidum* peptide of an acidic repeat protein, and instructions for carrying out the method of claim 16.